REMARKS

Claims 14, 15, 16, and 18-21 are pending and under consideration. Claims 14, 15, and 18-21 are amended herein. Claims 12, 13, and 17 are canceled herein without prejudice or disclaimer. Support for the amendment to claim 21 may be found in claims 12 and 13 as filed originally, and at page 2, paragraph [0010], 8th line, and page 3, paragraph [0013], 8th line of the specification.

This amendment is believed to place the application in condition for allowance, and entry therefore is respectfully requested. In the alternative, entry of this amendment is requested as placing the application in better condition for appeal by, at least, reducing the number of issues outstanding. Further reconsideration is requested based on the foregoing amendment and the following remarks.

Response to Arguments:

The Applicants appreciate the consideration given to their arguments. The Applicants, however, were disappointed to find that their arguments were not found to be persuasive. The final Office Action asserts in the first paragraph at page 2, that:

Note that Philofsky, US 3271600 shows connectors 53 at each end of half coil 16.

This is submitted to be incorrect. While the connector 53 appears to be connected to the ends of the duct labeled 16 in Fig. 1, this appears to be an error. Since the half coils 16, rather, are described as being placed in the longitudinal slots 15 in the inner periphery of the stator core at column 2, line 72, continuing at column 3, lines 1 and 2, and connectors 53 are described as attaching insulating tubes 52 to ducts 18 at column 3, lines 73, 74, and 75, continuing at column 4, line 1, it is more likely that the element labeled 16 in the lower end of Fig. 1 is actually duct 18, and not a half-coil at all, and Philofsky has no "coolant supply line and a coolant return line at axial ends of the stator winding," as recited in claim 21.

Still, in the interest of compact prosecution only, and not for any reason of patentability, claim 21 has been amended to define a "closed line system" further as a "closed cooling line system," as well as to clarify the location of the "coolant supply lines," and insert the feature that the coolant circulates flowing only by natural convection without mechanically pumping. Further reconsideration is requested.

Claim Rejections - 35 U.S.C. § 103:

Claim 12-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,271,600 to Philofsky et al. (hereinafter "Philofsky") in view of U.S. Patent No. 4,578,962 to Dustmann (hereinafter "Dustmann"). The rejection is traversed to the extent it might apply to the claims as amended. Reconsideration is earnestly solicited.

The 11th clause of claim 21 recites:

> The coolant is circulated by a thermosiphon effect with boiling and vaporizing, the coolant being heated or partially vaporized in the discrete coolant areas and being flowing by natural convection without mechanically pumping.

Neither Philofsky nor Dustmann teach, disclose, or suggest a "coolant is circulated by a thermosiphon effect with boiling and vaporizing, the coolant being heated or partially vaporized in the discrete coolant areas and being flowing by natural convection without mechanically pumping," as recited in claim 21. The final Office Action acknowledges that Philofsky does not show coolant circulated by a thermosiphon effect with boiling and vaporizing, the coolant being heated or partially vaporized in the discrete coolant areas, and seeks to compensate for it by combining Philofsky with Dustmann, saying in the last paragraph at page 4, that:

> At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to replace the circulation pump 55 of Philofsky, US 3271600 with a thermosiphon system of Dustmann, US 4578962. One of ordinary skill in the art would have been motivated to do this so that no separate pump is needed.

The cooling technique according to Philofsky, however, concerns a cooling system of a stator of an electric machine, in which in a closed system is effectuated a so-called "forced cooling" of a coolant in liquid or gaseous state. Therein is not contemplated an evaporation and a renewed condensation of the coolant, as in the claimed invention. An external pump or compressor, rather, is absolutely necessary for the circulation of the coolant in Philofsky. The cooling system of Philofsky, conversely, would not function without such a pump/compressor. In particular, as described at column 4, lines 8-17:

> The coolant for the stator winding is circulated by means of an external pump or compressor 55, depending on whether a liquid or gas is utilized, which circulates the coolant discharged from the machine through a cooler 56, of any suitable type, and through an entrance pipe 57 which passes through the housing 13 and is connected to the intake manifold 50. The coolant discharged at the opposite end of the machine flows from the discharge manifold 51 to a discharge pipe 58 which passes through the housing 13 to the pump or compressor 55.

It is submitted, therefore, that persons of ordinary skill in the art at the time the invention was made would not have been motivated to exchange such a forced cooling system of Philofsky for thermosiphon cooling according to Dustmann, since the cooling system of Philofsky would not function without a pump/compressor.

The dynamoelectric machine of Philofsky, moreover, is intended to cool a stator, as described at column 1, lines 54-64. The cooling system of Philofsky will not operate without a pump, as discussed above, and consequently the dynamoelectric machine of Philofsky will overheat if it is run without a pump. The dynamoelectric machine of Philofsky is not meant to overheat, since then it could not cool a stator. Thus, modifying Philofsky as proposed in the final Office Action would render Philofsky unsuitable for its intended purpose of cooling a stator, as well as inoperable, in contravention of M.P.E.P. § 2143.01. As provided therein:

> If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Since the dynamoelectric machine of Philosfsky could not cool a stator if it overheated, and the dynamoelectric machine of Philosfsky would only run without pump 55 until it overheated, modifying Philosfsky as proposed in the final Office Action would render Philosfsky unsatisfactory for its intended purpose of cooling a stator. There is thus no suggestion or motivation to make the proposed modification, *In re Gordon.*

Dustmann, for its part, describes no thermosiphon effect at all, and thus cannot make up for the deficiencies of Philofsky with respect to claim 21 in any case. Dustmann, rather, appears to provide cooling by convection, not a thermo-siphon effect, as described at column 1, lines 28-32. Dustmann, in fact, actually teaches away from the claimed invention at column 1, lines 18-27, when he notes that there is a danger of instabilities occurring when a two-phase helium is used for cooling.

The ninth clause of claim 21 recites:

> Said cooling line system thermally coupling said cold head to the heat generating parts of said stator to be cooled with the stator winding, having discrete coolant areas associated with the heat generating parts of said stator to be cooled and being thermally conductively connected over a large area to the stator parts to be cooled.

Neither Philofsky nor Dustmann teach, disclose, or suggest a "cooling line system thermally coupling said cold head to the heat generating parts of said stator to be cooled with the stator winding, having discrete coolant areas associated with the heat generating parts of said stator to

be cooled and being thermally conductively connected over a large area to the stator parts to be cooled," as recited in claim 21.

Philofsky, rather, teaches away from discrete cooling areas at column 1, lines 43-47, where he describes connecting an individual, i.e. discrete vent tube to each coil as "prohibitive in view of the large number of coils and tubes in each machine, which would require over 1500 connections for a typical machine."

Similarly, in Dustmann, coil form 10, including the feed canal 11, the collecting canal 12 as well as two cooling canals 13, are shielded all around by cold shields 27, 28, rather than being "discrete coolant areas associated with the parts of said stator to be cooled," as recited in claim 21. In particular, as described at column 3, lines 27-33.

> In FIG. 2, the feed canal 11, the collecting canal 12 as well as two cooling canals 13 can be seen. Although not shown in FIG. 1, in FIG. 2 the magnet winding 25 and the winding body or coil form 10 are shielded all around by cold shields 27, 28, and the entire system is mounted in a vacuum container formed of an inner jacket 29 and an outer jacket 30.

Thus, even if Philofsky and Dustmann were combined, as proposed in the final Office Action, the claimed invention would not result. Claim 21 is submitted to be allowable. Withdrawal of the rejection of claim 21 is earnestly solicited.

The seventh clause of claim 21 has been amended to recite:

> A coolant supply line at one axial end of the stator winding and a coolant return line at the other axial end of the stator winding.

Neither Philofsky nor Dustmann teach, disclose, or suggest "a coolant supply line at one axial end of the stator winding and a coolant return line at the other axial end of the stator winding," as now recited in claim 21. As it can be gathered from the Dustmann disclosure, therein the coolant is fed to and removed from the axial middle of a magnet winding. This disclosure lacks any indication that in the case of the disclosed magnet winding it could deal with the stator winding of an electric machine. Also on account of this reason, it is submitted that persons of ordinary skill in the art at the time the invention was made would have not considered exchanging the cooling system according to Philofsky for one according to Dustmann to be easily possible.

Finally, in Dustmann, a cooling is effectuated only by the outer radial edge while in the claimed invention the heat generating parts of the stator are included in the coolant supply system.

Claims 14, 15, 16, 18, 19, and 20 depend from claim 21 and add additional distinguishing elements. Claims 14, 15, 16, 18, 19, and 20 are thus also submitted to be allowable. Withdrawal of the rejection of claims 14, 15, 16, 18, 19, and 20 is earnestly solicited.

Conclusion:

Accordingly, in view of the reasons given above, it is submitted that all of claims 14, 15, 16, and 18-21 are allowable over the cited references. There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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